REMARKS

Allowable subject matter

The Examiner's indication of allowable subject matter for claims 10-21 is gratefully acknowledged. Claim 10 has been rewritten in independent form to include the limitations of claim 9 and claim 1 as presented in the response of October 2006. Claim 11 has been rewritten in independent form to include the limitations of claim 1 as presented with the response of October 2006.

Claim objections

Claim 8 was objected to because quotation marks to be deleted appeared to be underlined. With this amendment, it is clearly indicated that the quotation marks should be deleted by the use of double brackets (37 CFR 1.121).

Entry of the amendment and withdrawal of the objection is respectfully requested.

Rejection under 35 U.S.C. § 102(b) (Fisher)

Claims 1-5, and 7 are rejected under 35 U.S.C. § 102(b) as anticipated by US Patent 5,800,706 (Fisher).

Fischer discloses porous materials made from nanofiber packed beds. Porosity and packing structure can be altered by blending nanofibers with scaffold particulates. The packed beds have a plurality of nanofibers and a number of scaffold particulates that have larger dimensions than the nanofibers. The packed beds can be used as chromatographic media.

Present claim 1 has been amended to clarify that the packing material "consists of elastic wires". The claimed column differs from the column of Fisher which is heterogenous and includes both scaffold particulates and nanofibers. Accordingly, Fisher does not teach the presently claimed invention. Furthermore, the claimed invention is patentable over Fisher for the following reasons.

The nanofibers are preferably carbon fibrils, having a diameter of less than 1 μm, most preferred of less than 0.05 μm (see column 4, lines 28-31 and lines 54-57), and a L/D ratio greater than 5 (see column 5, lines 8-10 and col. 5, lines 26-28).

In a preferred embodiment, Fischer discloses scaffold particulates having the largest dimension, i.e. the length, 200 times greater than the largest dimension of the nanofibers. The

second largest dimension, i.e. the diameter, is also 200 times greater than the diameter of the nanofibers (Col. 7, lines 1-20). Thus, in view of the above dimensions of the nanofibers, the diameter of the scaffold particulates is less than 200μm and preferably less than 10 μm and the length is greater than 1 mm, and preferably greater than 50 μm.

Fischer discloses elastic wires as such. However, Fischer does not teach a column having a packing consisting of said wires, and does not refer to a column for specific use in ATREF analyses. Even if it is considered that Fischer inherently discloses a specific ATREF column - *quod non*- the applicant notes that Fischer does not disclose the use of only scaffold carbon fibers, but the combination of carbon fibrils and larger carbon fibers.

In addition, in reference to point 6. of the Communication, the Applicants emphasize that such combined use of fibrils and fibers does not provide a packing that is capable of being applied in an ATREF column and **differs structurally** from the invention of claim 1 as amended which is directed to a column packing consisting of elastic wires. Furthermore, Applicants submit that the intended use recitation in claim 1 cannot be disregarded. The intended use results in a structural difference between the claimed column and the prior art column of Fischer. More in particular, the structural difference includes the distribution of the fibrils/fibers in the column packing and the presence of two different domains in the packing disclosed by Fischer. Such two domains cannot be present in the column packing as now claimed. The prior art column disclosed by Fischer is NOT capable of being used in ATREF analyses for the following reasons:

1) Nanofiber packed beds disclosed in Fischer contain carbon nanofibers and scaffold particulates. Both materials have different dimensions and the distribution of scaffold particulates within the nanofiber packed bed is nonuniform (see col. 9, lines 31-33) and therefore two different domains are formed. Thus, the interstices between the nanofibers are irregular in both size and shape (see col. 9, line 55). Packed beds result in a bimodal pore size distribution with small pore spaces within the nanofiber domains and large void space between the two domains (see col. 9, lines 60-67).

In contrast, the elastic wires of the presently claimed invention provide a homogeneous packing, in order to allow the polymer to precipitate from a solution.

Applicants submit that the presence of nanofibers as packing, as is the case in Fischer, will block the flow in the domain occupied by nanofibers when precipitation of the polymer

occurs, and control of the dissolution and the elution of the polymer precipitated on nanofibers when the temperature is raised will not be possible. Thus, the packing described by Fischer could not be used for ATREF analysis. Elastic wires used in the present invention will lead to improved sensitivity and better baseline.

In addition, even if only nanofibers or only carbon fibers are used in the column of Fischer, columns with such packings would not be suitable for performing an ATREF method. Applicants are of the opinion that nanofibers are not suitable due to their dimension. Furthermore, Fischer does not provide any indication or experimental data that the carbon fibers could be used in an ATREF column.

2) Moreover, Fischer divulges that the fluid flow rate in water should be greater than 1.0 ml per min per cm^2 in a preferred embodiment for a bed having a thickness of one mil (1 mil corresponds to 25.4 μm) (Col. 8, lines 50-55). In contrast, in the present invention, the flow rate used is less than 1.0 ml per min. Based on 1 mm wires diameter, the specific surface area per cubic centimeter column volume is 8 square centimeter and the flow rate is less than 0.125 ml per min per cm^2. The flow rate described by Fischer is not suitable for ATREF analysis.

From the above, it is clear that the prior art column disclosed by Fischer is therefore NOT capable of performing the intended use, and therefore does not meet claim 1.

Furthermore, claims 1-9 are now limited to the use of a homogenous single packing material which is contrary to the teaching of Fisher.

Claims 2-9 depend from claim 1 and have all of the limitations of claim 1. Accordingly, it is respectfully submitted that claims 2-9 are also patentable over Fisher, at least for the reasons presented above for claim 1.

In view of Applicants' amendments and arguments, reconsideration and withdrawal of the above ground of rejection is respectfully requested.

Rejection under 35 U.S.C. § 103(a) (Fisher)

Claim 8 is rejected under 35 U.S.C. § 103(a) as being unpatentable over US Patent 5,800,706 (Fisher).

The Examiner has rejected claim 8 as being unpatentable over US Patent 5,800,706 (Fisher). Although Fisher does not explicitly disclose the dimensions of a column for use with the packing, the Examiner asserts that it would have been obvious to one of ordinary skill in the

art to arrive at the dimensions set forth in claim 8. However, since claim 8 depends from claim 1, which is neither taught nor suggested by Fisher, the invention defined in claim 8 is also patentably distinguished from the references, alone or in combination. Applicants respectfully request the withdrawal of the rejection.

Rejection under 35 U.S.C. § 103(a) (Britto)

Claims 1-3, 5, and 9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Britto, et al. ("High Density Polyethylene Fraction with Supercritical Propane")

Britto et al. disclose a method for fractionating polymers using supercritical fluid fractionation (SFF) and CITREF. Britto, et al. disclose the use of an extraction column comprising a *stainless steel knitted mesh* as packing (see page 554, right column, last paragraph, and page 555, left column, second paragraph).

Claim 1 is directed to a column wherein the packing of said column consists of elastic wires having a length per diameter (L/D) of at least 3. Accordingly, the mesh column of Britto, et al. is structurally different from Applicants' claimed column with elastic wires. Furthermore, Britto et al. do not provide any teaching on the use of L/D ratio of either mesh or wires present in the column.

The Examiner considers that such a feature is obvious to one of ordinary skill in the art. Applicants respectfully disagree. A stainless steel mesh is structurally different in shape from elastic wires. A mesh is interwoven and would not be readily described in terms of L/D. It is hereby submitted that Britto, et al. disclose a column which is structurally different from the column claimed in the present invention and do not teach or suggest "a column packing [which] consists of elastic wires having a length per diameter (L/D) of at least 3" as now claimed.

In reference to point 12. of the Communication, Applicants point out that the intended use formulated in claim 1 results in a **structural difference** between the claimed column and the prior art column of Britto, et al. The column packing of Britto comprises a knitted mesh and a mesh contains holes which is suitable for preparative TREF, not ATREF. In contrast, wires according to the claimed invention provide a homogeneous packing without holes suitable for ATREF. A homogenous packing is to be used for allowing good precipitation of a polymer from a solution. If the polymer remains suspended in the solvent (the mobile phase), it will be lost for

the analysis and give baseline problems. In view hereof, the prior art column disclosed by Britto, et al. is NOT capable of being used in ATREF analyses. The ATREF column packing has to remain homogeneous for high variations of temperature and pressure which occur during the analysis; only a packing which can adapt by compression, such as wires, turns out to be suitable herefore. A packing consisting of a mesh is not suitable herefore.

Applicants submit that starting from Britto et al. it is not obvious to arrive at the column of the present invention. There is no motivation to alter the mesh of Britto, et al. to the elastic wires of the claimed invention. It is not possible to use the column of Britto for ATREF. The two columns (the present one and the one from Britto) are very different. Britto et al. describes a column with a mesh packing for preparative TREF, which is not suitable for analytical TREF.

In view of the above, it is submitted that the claimed column is not obvious in view of the teachings of Britto, et al.

Claims 2-9 depend from claim 1 and have all of the limitations of claim 1. Accordingly, it is respectfully submitted that claims 2-9 are also patentable over Britto, et al., at least for the reasons presented above for claim 1.

In view of Applicants' amendments and arguments, reconsideration and withdrawal of the above ground of rejection is respectfully requested.

CONCLUSION

In view of Applicants' amendments to the claims and the foregoing Remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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